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ABSTRACT

Designed to present interesting facts about science and to heighten the curiosity of primary age students, this book contains activities about the natural world and numerous black and white illustrations. The activities focus on plants with an emphasis on pollens and seeds. The first section, entitled "Pollen, Plants and People," consists of songs, art exercises, and instructions for making a puppet. Pollinators are highlighted in the second section through puzzles, a song, an experiment, and a game. The third section is devoted to exercises using seeds. Suggestions for extended activities are included in the teacher/parent guide section. (ML)

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A GOOD APPLE ACTIVITY BOOK FOR PRIMARY GRADES

GOOD APPLE

YOUNG SCIENTISTS EXPLORE

The Kingdom of Plants

BOOK 7 PRIMARY LEVEL

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By Linda Penn · Illustrated by Elaine Scott

YOUNG SCIENTISTS EXPLORE

THE KINGDOM OF PLANTS

BOOK 10—PRIMARY LEVEL

by

LINDA PENN

illustrated by **ELAINE SCOTT**

cover by **VALERIE LEEDOM** and **TOM SJOERDSMA**

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PREFACE

Plants very often merit no more than an occasional glance from young children, fitting nicely into the unexplored background of their world. Yet plants are of major importance to all life. Not only do they provide for lovely surroundings, but can be a source of food and shelter as well. Even the very air we breathe is improved by the existence of plants.

Young Scientists Explore The Kingdom of Plants will allow children and the caring adults in their lives, to discover the fascinating story of a seed, from its inconspicuous beginning as pollen. They will meet the book mascot, Peter Pollen, a tiny speck of potential plant life. The initial activity pages will introduce two important members of Peter's pumpkin plant family. His flower parents, beautiful male and female blossoms, have a marked difference in appearance easily perceived by children. Then fun-to-draw scientific signs for male and female will be demonstrated. Peter's pollen pathway will also lead to nature's largest plant, the tree. The formation of tree seeds like acorns, from pollen-producing "catkin" flowers, will be explored through art, songs, and even a special snack. The advent of Kernella Cob, a Sweet Corn Puppet, provides further proof that some tasty seed treats owe their existence to pollen. A teaching puppet pattern is included, along with a few "corn conscious" science suggestions that can make "husking" sweet corn a meaningful experience.

The second section of the book concentrates on another principal in our seed story cast, the honeybee. Harriet Honeybee bows in with a song and pollen experiment, designed to prove that "powdery" pollen, "hairy" bee bodies, and "sticky" flower stigmas, just naturally go together. Thanks to this togetherness, many fruits and vegetables can be grown for our eating enjoyment (see p. 19). The adventures of Peter Pollen on his way to "**bee**-coming" a pumpkin seed are put into story form on pp. 20-23. The story is based on actual events that can be observed, summer through fall, in gardens and fields. That is when beautiful orange/yellow pumpkin flowers becken female honeybees to nectar-rich feasts. Bees will initially visit the male flowers, the first to bloom, where they not only drink nectar, but also mix pollen with freshly made honey. This honey-pollen mixture is packed into leg baskets and destined to become food for the young back at the beehive. Female pumpkin flowers do not supply pollen, of course, but with their nectaries full, tempt pollen-covered bees to stop for another drink. The pollen powder that clings like dust to the bee's hairy body, readily falls off as the bee drinks. Some will land on the sticky stigma of the female flower, triggering pollination. The tiny speck of life contained in the pollen granule grows from the stigma down into the female flower where it brings an immature seed to life (see p. 25). Living seeds need to be nourished, so the flower seed chamber enlarges to provide food, eventually becoming a pumpkin. (It's intriguing to look for the dried female flower parts underneath a harvested pumpkin.)

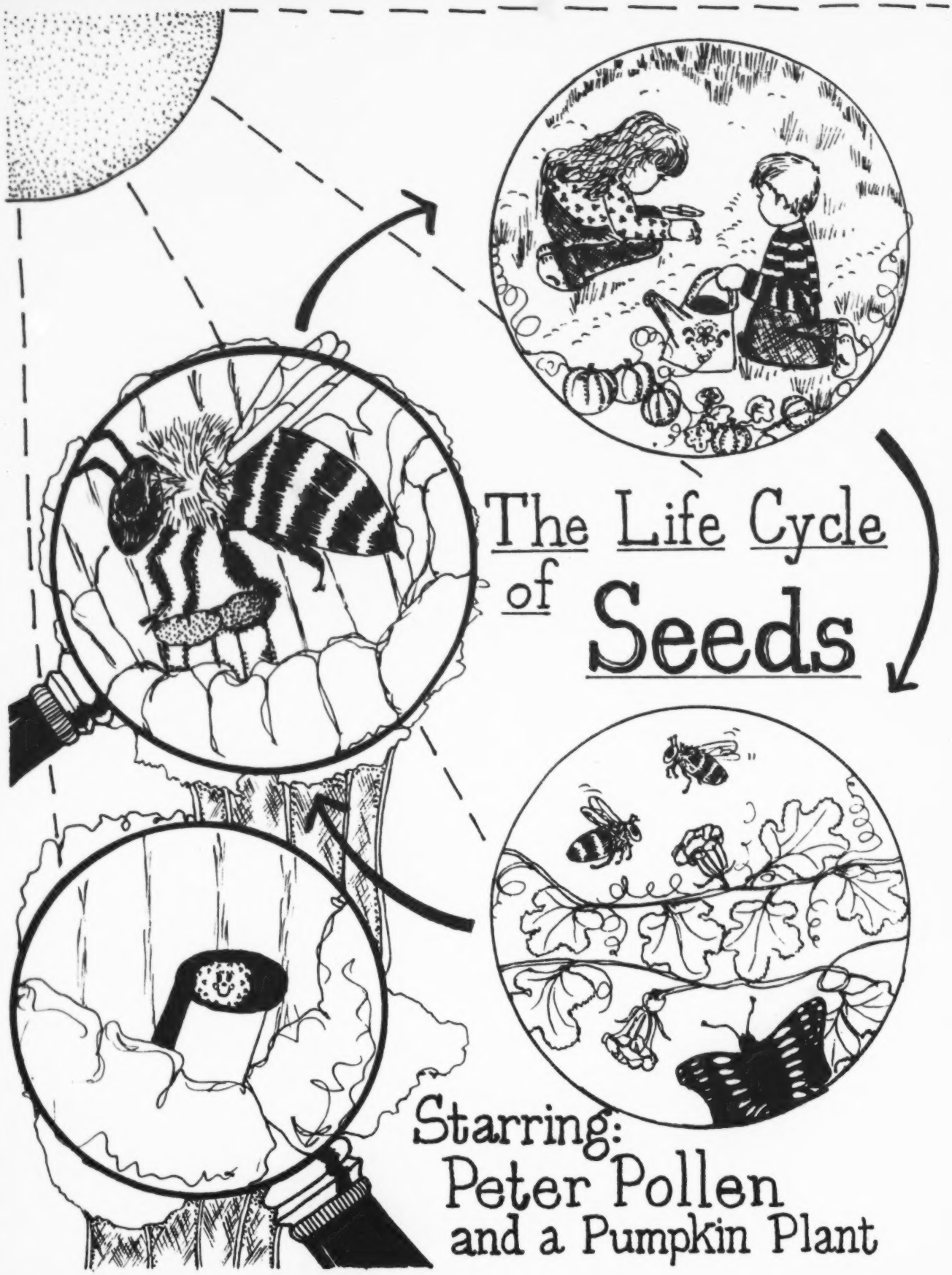
Once pollination has been thoroughly explored, be sure and plant some seeds. Establish with certainty that there is life within a seed following pollination. Tried and true planting instructions are given in "The Green Thumb Guide." Extending ideas are detailed in the Teacher/Parent Guide, inside the back cover. (The T/P Guide is "must" reading and should be used in conjunction with the specific activity pages listed.)

Thank you for your interest in children and in science. Your commitment to both can only improve the natural world in which we live. If I can be of further assistance, please write to Linda Penn, c/o Good Apple, Box 299, Carthage, IL 62321.

Reach out for the hands
of a curious child.
Share living science,
for it opens young eyes
TO THE WONDER AND BEAUTY OF LIFE.

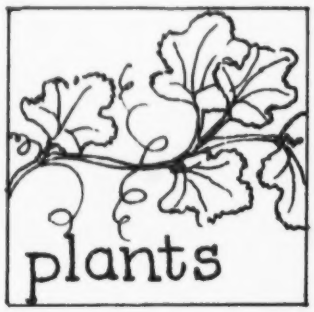
Your friend in science,

Linda Penn


The Life Cycle
of
Seeds
Starring:
Peter Pollen
and a Pumpkin Plant

Pick a Picture Word

My name is Peter Pollen.
I have a story for you.
It will tell
how _____ begin,
and best of all
this story's true!



I am only a speck of dust
but very important, you see.
For, if I do my job just right,
a brand-new _____
will come to be!
Please join me as I travel
through the kingdom
of growing _____
and meet my insect helpers

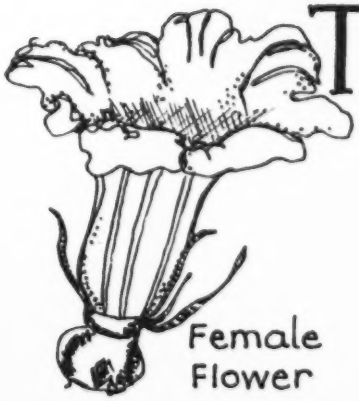
some _____,

_____,

 and ants.

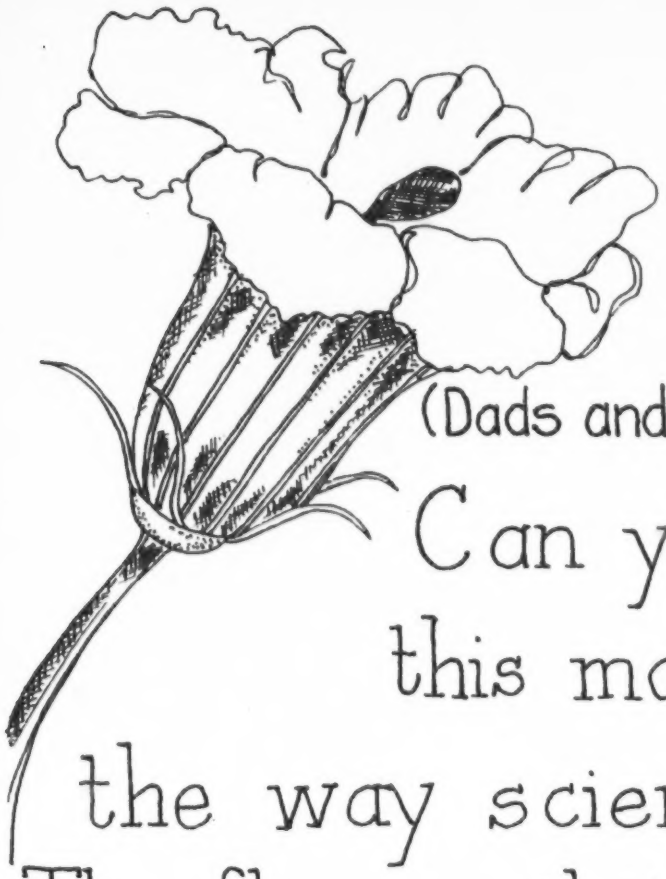
Peter's Garden Guide

The sun warms the garden
where I began.
It looks like a
leaf and flower land.
Now, if you check closely
you will see . . . .
two different flowers.



This flower → made me!

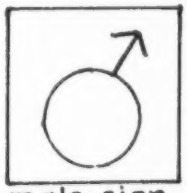
9



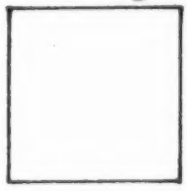
Male flowers make pollen.

(Dads and boys are males, too.)

Can you write this male sign the way scientists do?



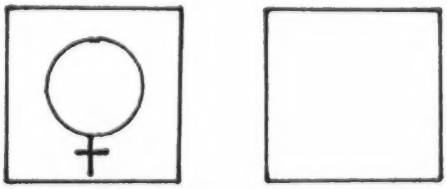
male sign

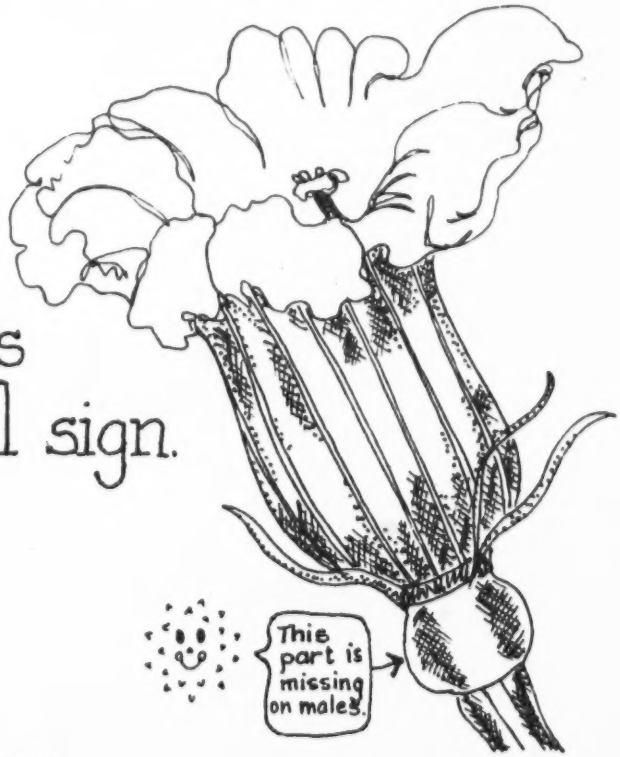


The flowers that are female grow at the same time.

Mothers, girls and female flowers also have a special sign.

female sign



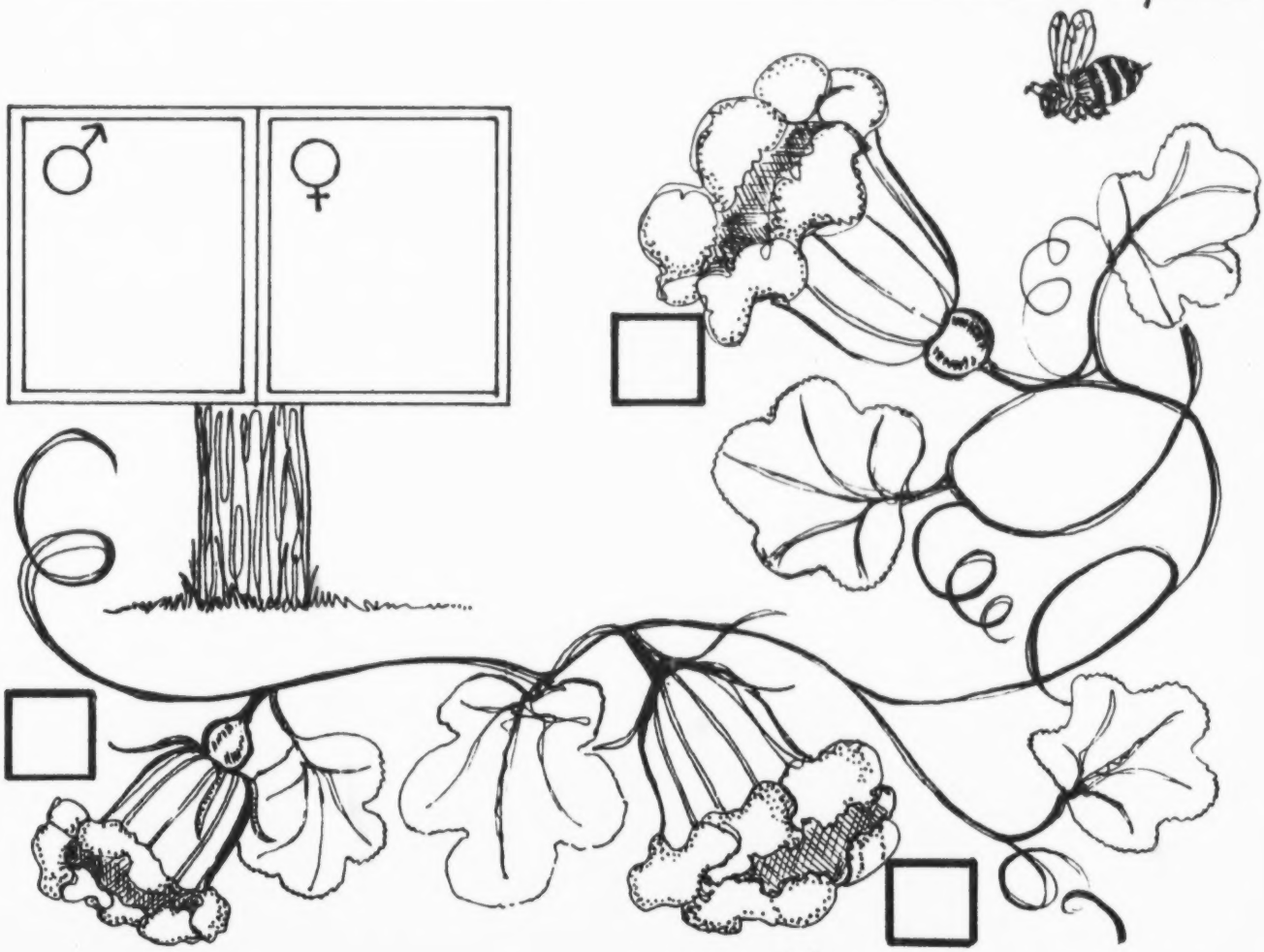


Show and Tell

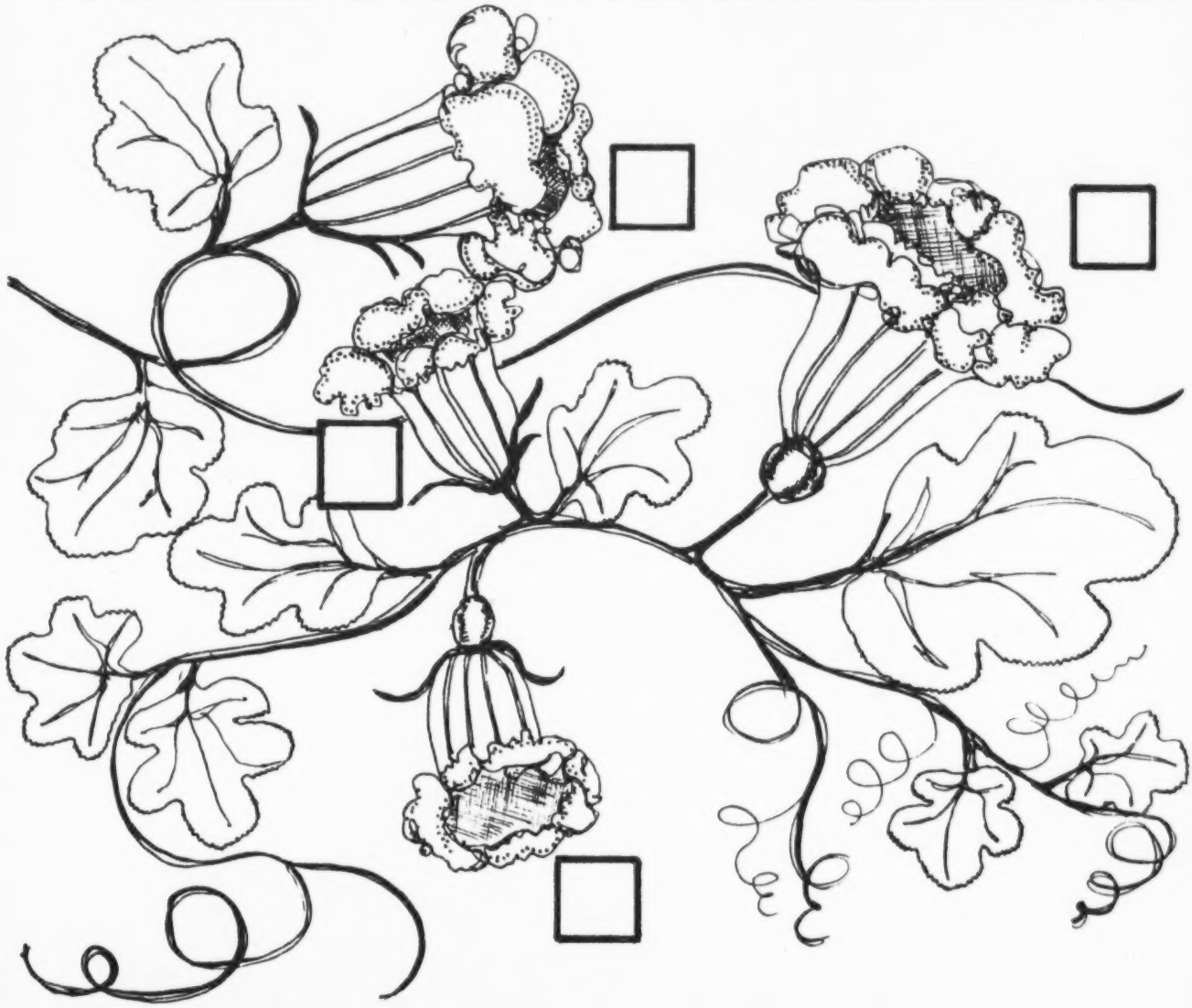
Gardening

Fly into my garden and
pretend you're a bee.
As you visit each flower,
mark the tally for me.

Thank you!

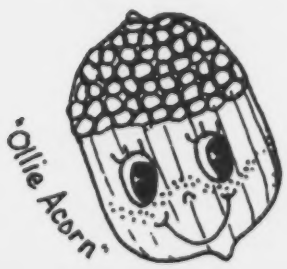


Now you're a scientist.
Use your pencil again.
Give each flower its sign.
On your mark... please begin!



Follow the Pollen Path to . . .

Pollen is very important
when it comes to large plants like trees.
The male ♂ flowers make pollen
to be carried away in a breeze.
(This is also a pollen, that sometimes makes people sneeze)
The male ♂ flowers, called catkins,
are seen rather late in the spring.
These caterpillar look - alikes
are tiny flowers on a string.
Male pollen is caught by the females ♀
with their sticky flower parts.
Special tree seeds like acorns
will soon be able to start.



Now you know how acorns begin with pollen powder and oak catkins.

a Catkin Celebration

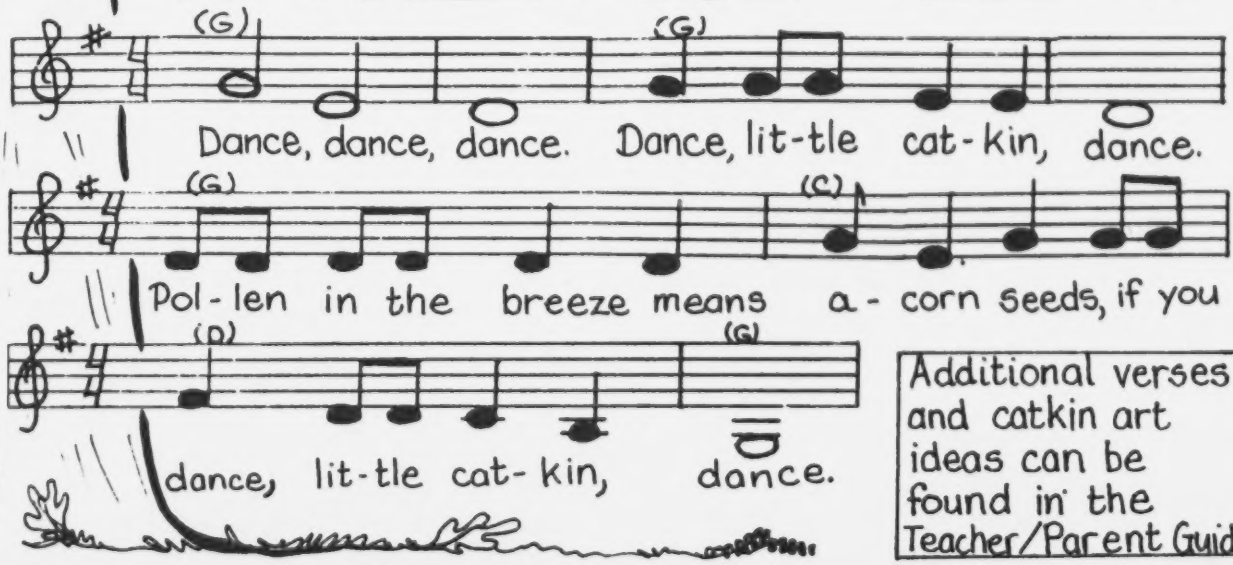
You are invited to sing, dance and string a catkin!

Male ♂ catkins seem to dance
when springtime breezes blow.
Just look at a tall oak tree
and you will see it's so.

Before singing, try stringing a catkin!

YOU WILL NEED

(1) raisins (2) rounded toothpicks (3) red "string" licorice, cinnamon/cherry flavor (4) plastic sandwich bags. Punch hole in middle of raisin and then pull toothpick through hole. Thread raisins on licorice, after loosely tying ends. (Optional - Place materials needed in plastic bag for an individual String-a-Catkin kit.) It's time to swing about, sing about and enjoy edible catkins.



Additional verses and catkin art ideas can be found in the Teacher/Parent Guide

Pollen in the Cornfield

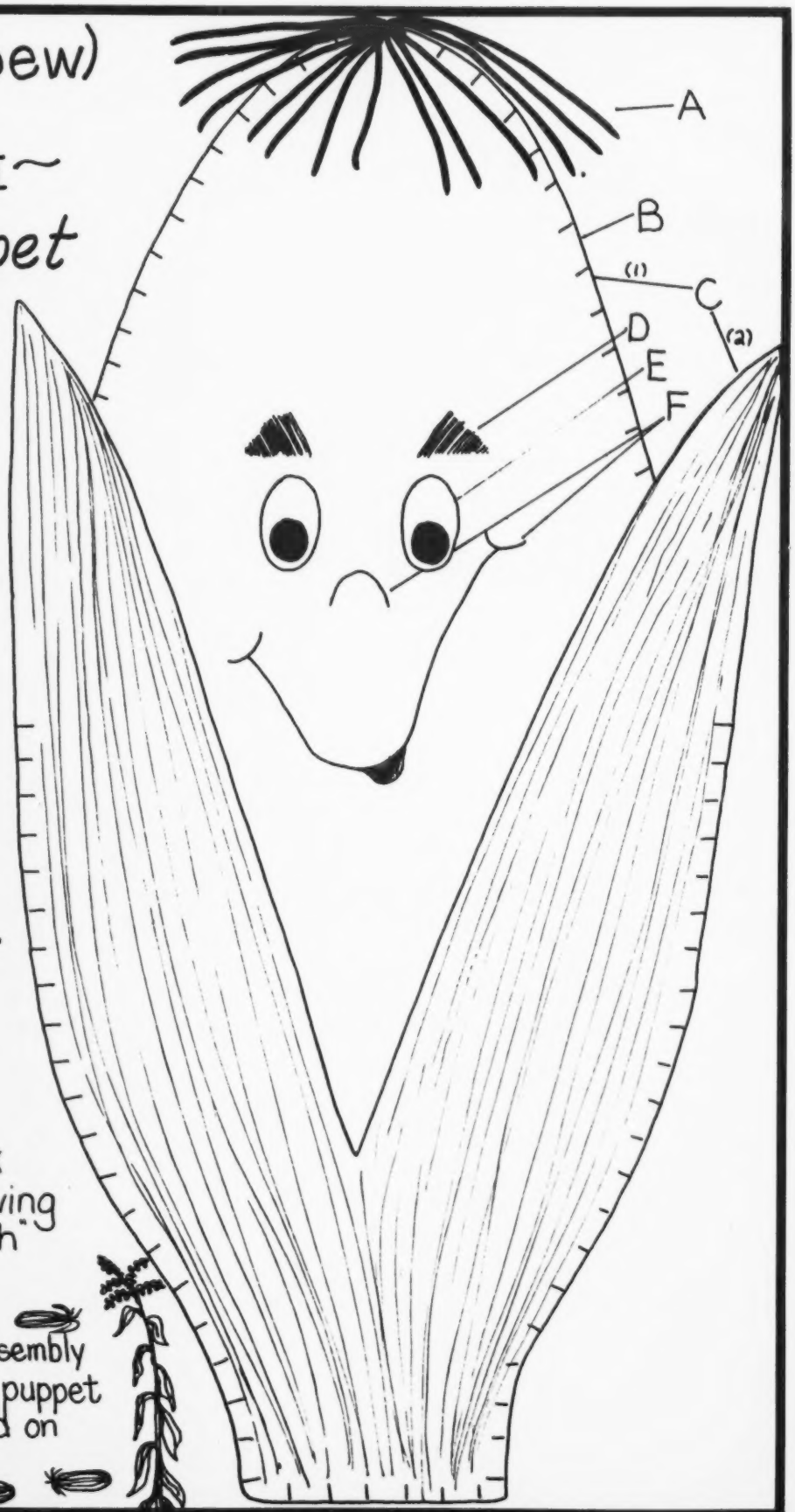
My friend's name is
Kernella Cob.
This is a
special treat –
Children think corn on the cob
is very good to eat!

Did you know
every kernel
has ♀ female flower hair?
The cob hairs
catch ♂ male pollen
so seed kernels
can grow there.

(Simple-to-Sew)

Kernella~

A Corn Puppet



Materials required:

(A) Cream or yellow yarn for ♀ "flower hair"

(B) Yellow felt for "cob" front (matching yellow thread)

(C_1) Green felt for "cob" back, and

(C_2) "husk" leaves (green thread)

(D) Cream-colored thread for "brows"

(E) Oval (glue-on) movable eyes

(F) Narrow tip permanent black marker for drawing "nose" and "mouth"

Instructions for assembly and patterns for puppet pieces can be found on pages 12 and 13.

Attach yarn hair here on "B."

(2)

B

"Cob" Front

(yellow felt)

- CUT ONE -

FRONT

COB

COB

BACK

(Cut here for hand slit on "C$_1$")

also

C$_1$

"Cob" Back

(green felt)

- CUT ONE -

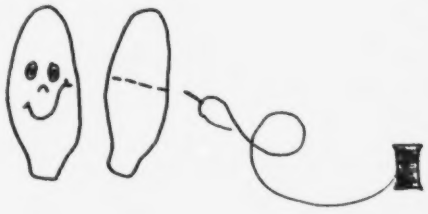
Assembly Instructions

1. Complete facial features on "B" using puppet picture from preceding page as a guide.

2. Cut ten pieces of yarn (approximately 8" long); fold in half and sew to center top of "B" on back side

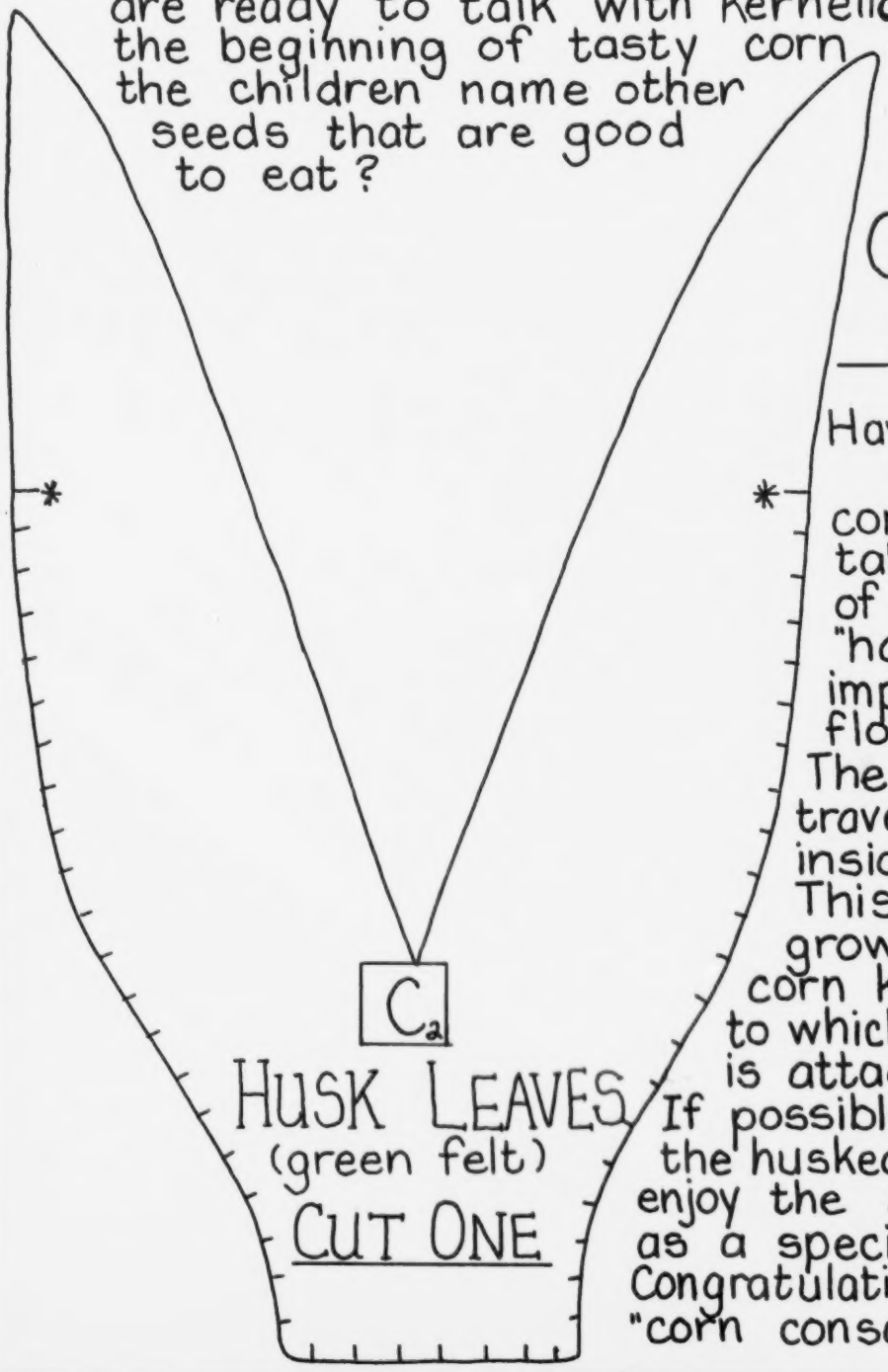
3. Cut hand slit on "C$_1$" as indicated by broken lines.

4. Whipstitch "B" to "C$_1$" halfway around pattern pieces as shown.



Assembly (cont'd.)

5. Whipstitch "C_2" to front of puppet "B" beginning at points indicated by *'s. (Sew through three thicknesses to include "C_1.")
6. Insert hand in back of puppet and you are ready to talk with Kernella Cob about the beginning of tasty corn seeds. Can the children name other seeds that are good to eat?



Conscious Science

Have children husk ears of sweet corn carefully, taking notice of the corn-silk "hair," an important ♀ flower part. The ♂ pollen travels in a tube inside each hair. This begins the growth of the corn kernel or seed to which the hair is attached. If possible, steam cook the husked corn and enjoy the sweet kernels as a special snack. Congratulations on becoming "corn conscious"!

Pollen Puzzlers

♂Male pollen is important in helping plants make _____

Some pollen couldn't do the job without insects like _____.

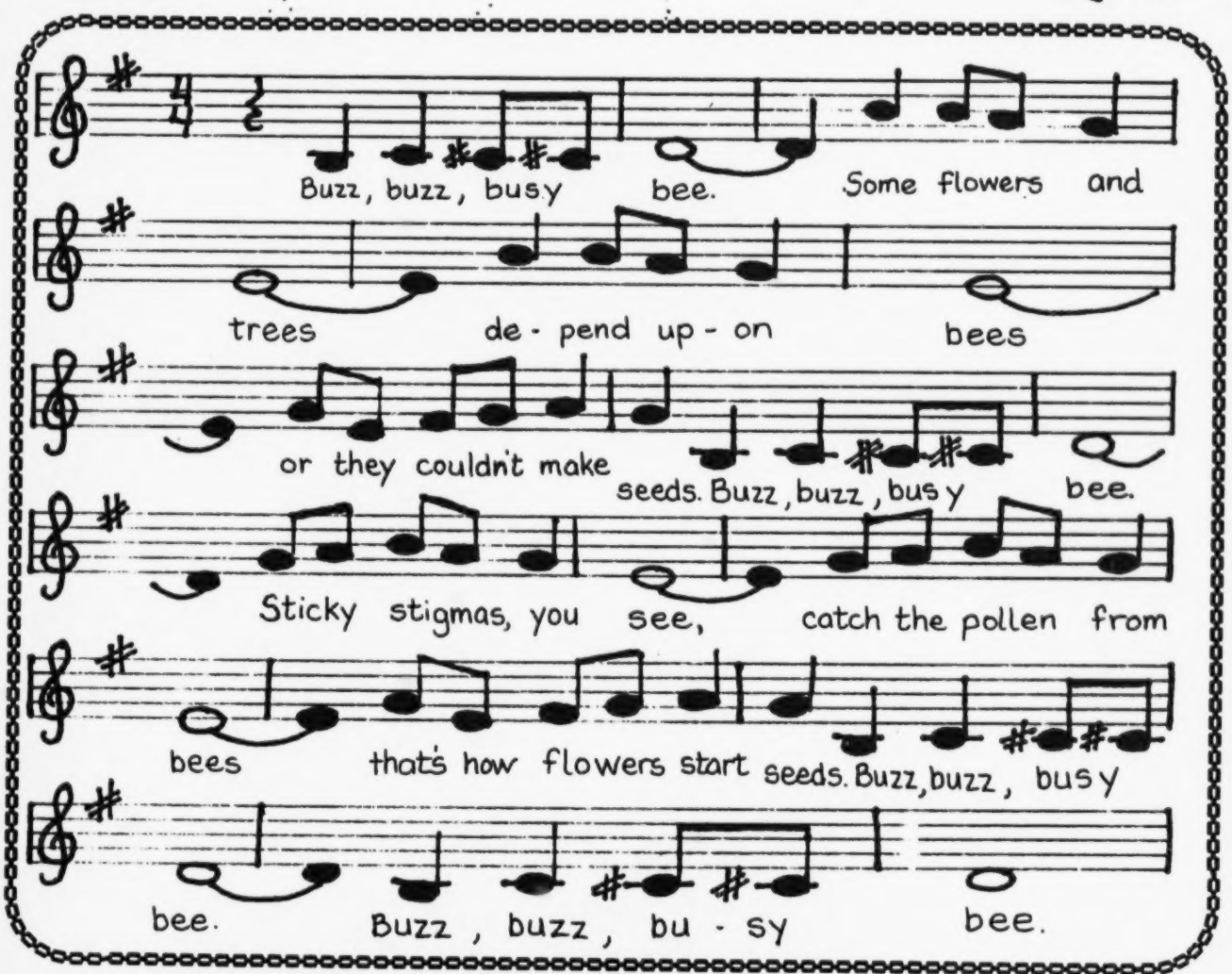
Pollen is a powder that easily clings to hair.

Hairy, flower-feeding bees spread _____ everywhere.

An insect like the busy bee, drops some pollen as it feeds.

The ♀ _____ flower's sticky part catches the pollen so _____ can start.

Bzzz, Bzzz, Busy Bee


Buzz, buzz, busy bee. Some flowers and
trees de - pend up - on bees
or they couldn't make seeds. Buzz, buzz, busy bee.
Sticky stigmas, you see, catch the pollen from
bees that's how flowers start seeds. Buzz, buzz, busy
bee. Buzz, buzz, bu - sy bee.

(This song is fun to sing with syncopation.)

Let's experiment with

Pollen "Picker-Uppers"

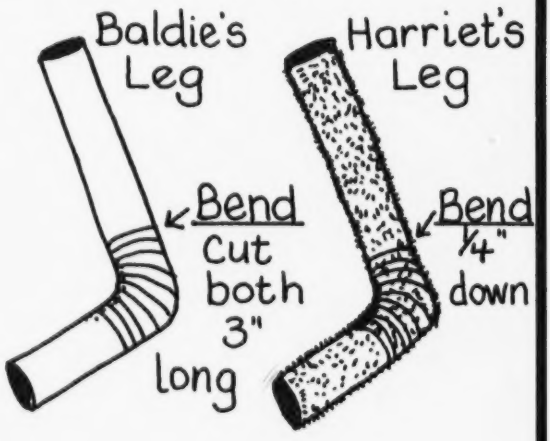
Finger Puppet Patterns

My name is Harriet Honeybee. I carry pollen all over me.

I am Baldie Honeybee. There isn't any hair on me. Can I carry much pollen? Try this and see.

Materials needed:

Black or brown pipe cleaners
Bendable plastic straws
Paper cup ~ 5oz. size
Flour (pollen substitute)
Double-stick tape



Setup:

Cut and bend pipe cleaners and soda straws as shown.
Cut paper cup to 1" from bottom for center of ♂ flower.
Fill cup partially with flour "pollen" and place in the middle of ♂ flower, page 17.
Put a piece of double-stick tape on each "stigma" in ♀ Flowers "H" and ♀ Flowers "B."

Actual experiments described on page 18.

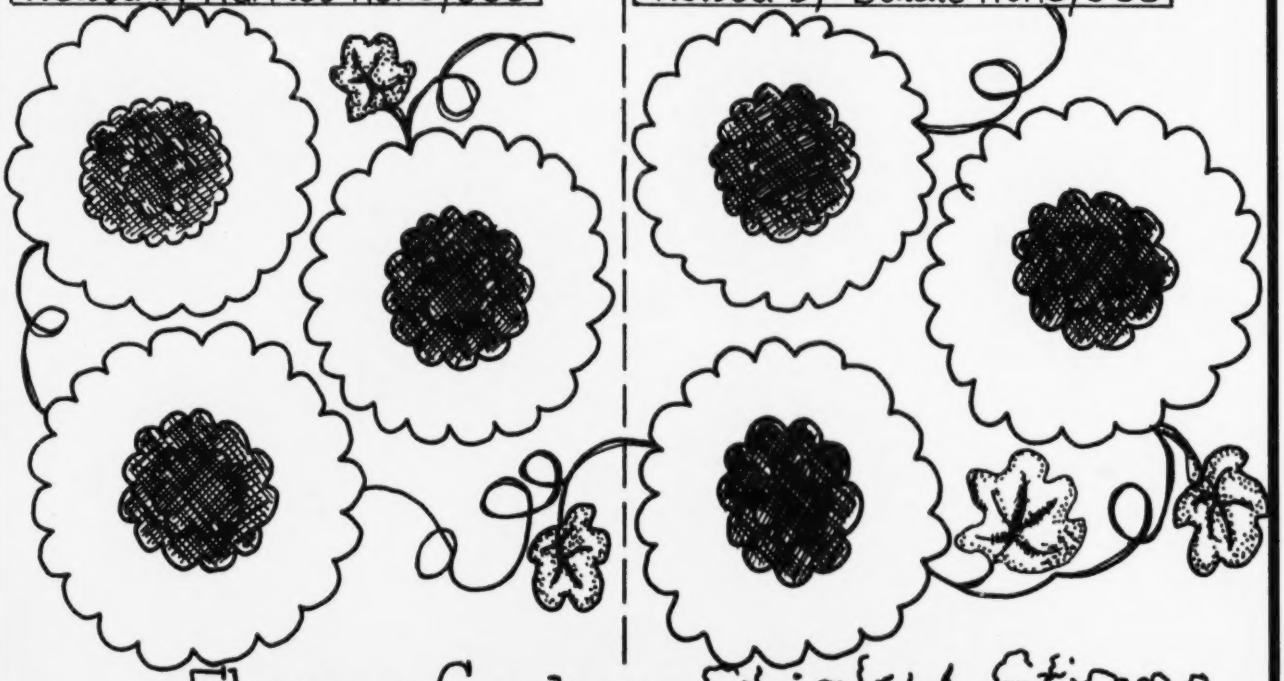
Flower with ♂ Pollen

Place cup of "Flour Pollen" Here

Visited by Harriet and Baldie Honeybee

♀ Flowers "H" visited by Harriet Honeybee

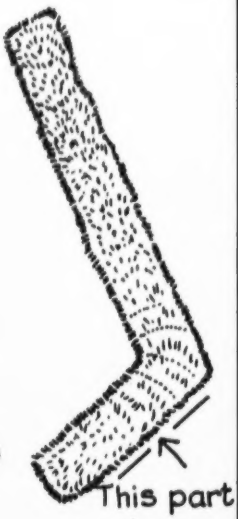
♀ Flowers "B" visited by Baldie Honeybee



Flower Center = Sticky Stigma

Step into Flower Science

Step 1. Child touches "flower pollen" in center of ♂ flower with Harriet's hairy leg (pipe cleaner) and then Baldie's smooth leg (plastic straw). Compare the "legs." Which leg appears to be holding more pollen? Harriet's? ☐ Baldie's? ☐ ☒ square that best fits results.



This part is placed in pollen.

Step 2. Child places the "pollen-covered" portion of Harriet's "leg" on one of the "sticky stigmas" in ♀ Flowers "H". The same is done with Baldie's "leg" but on a stigma in ♀ Flowers "B."

Conclusions

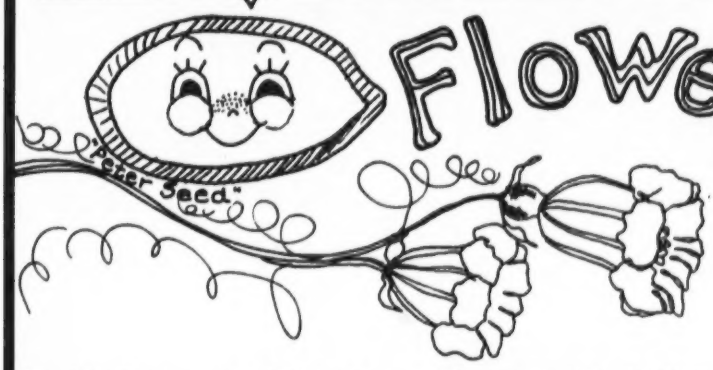
More ♂ pollen is spread on a ♀ flower stigma by bees ... with hairy legs
... with hairless (smooth) legs ☐

Finger Puppet Method

Step 3. Make a copy of page 16. Cut out bee puppet patterns. Cut two of Harriet Honeybee out of 7 x 7 inch piece of "hairy" material. (Usually available as inexpensive scrap piece from fabric store.) Whipstitch edges leaving opening for inserting finger at bottom of bee puppet. A black pipe cleaner can be cut and glued on for the stripes. Glue two small pieces of pipe cleaner on bee's head for the compound eyes. Baldie Bee's pattern should be traced and cut from a piece of smooth vinyl fabric. Whipstitch and leave opening for finger as above. Draw stripes and eyes with black permanent marker.

Step 4. Same procedure as above (steps 1 and 2) but use finger puppets in place of pipe cleaner and soda straw "legs."

I'm now a seed thanks to...



Flowers and Bees

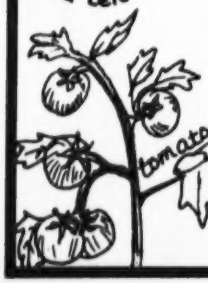
A Science Sing-a-Long, Celebrating Good Things to Eat

(1) Flowers and Bees Flowers and Bees
(2) Flowers and Bees, Flowers and Bees

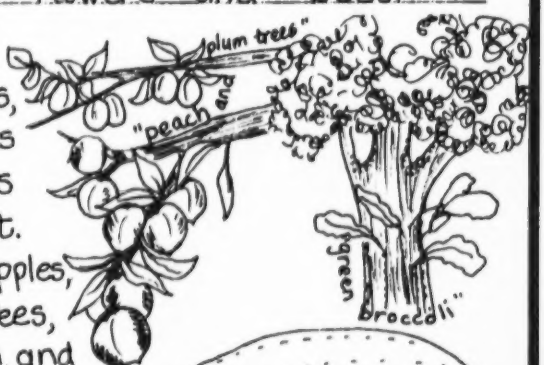
(1) Help make the "veg-gies" We like to eat. Crunchy
(2) Help grow the food that peo-ple can eat. Red to-

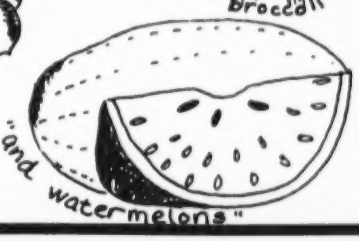
(1) car-rots and cele-ry and "yummy" corn seeds Be-
(2) ma-toes, orange pump-kins and green broc-co-li Be-

(1) gin with the wind and those flowers and bees,
(2) gin with the sun and those flowers and bees.



Verse 3
Flowers and Bees,
Flowers and Bees
Make "juicy" fruits
that we like to eat.
Watermelons and apples,
peach and plum trees,
begin with the sun, and
those flowers and bees.





A SEED Story

(starring Peter Pollen and Harriet Honeybee)

At the honeybee hive
it's a sunshiny day

and fifteen (♀) female bees
soon fly on their way.

They will feed at a favorite
flower patch

and collect all the pollen
they can catch.

(Both honey and pollen are used as food by bees.)

Not far from the hive
pumpkin seeds have been growing.

Look at Farmer Green's field;
the (♂) male flowers are showing!

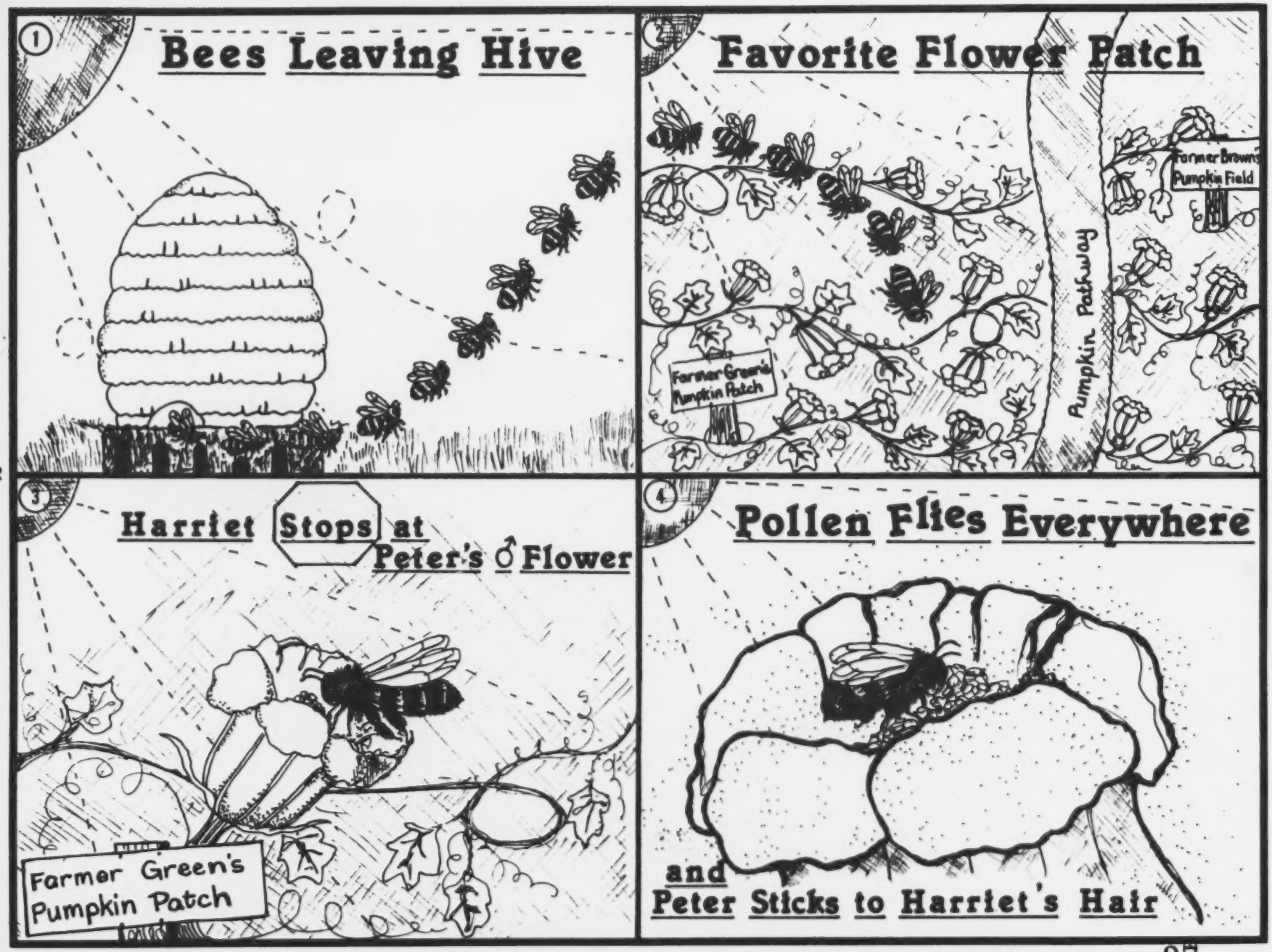
While across Pumpkin Pathway
some sweet (♀) female flowers
are ready and waiting
for a (♂) male pollen shower.

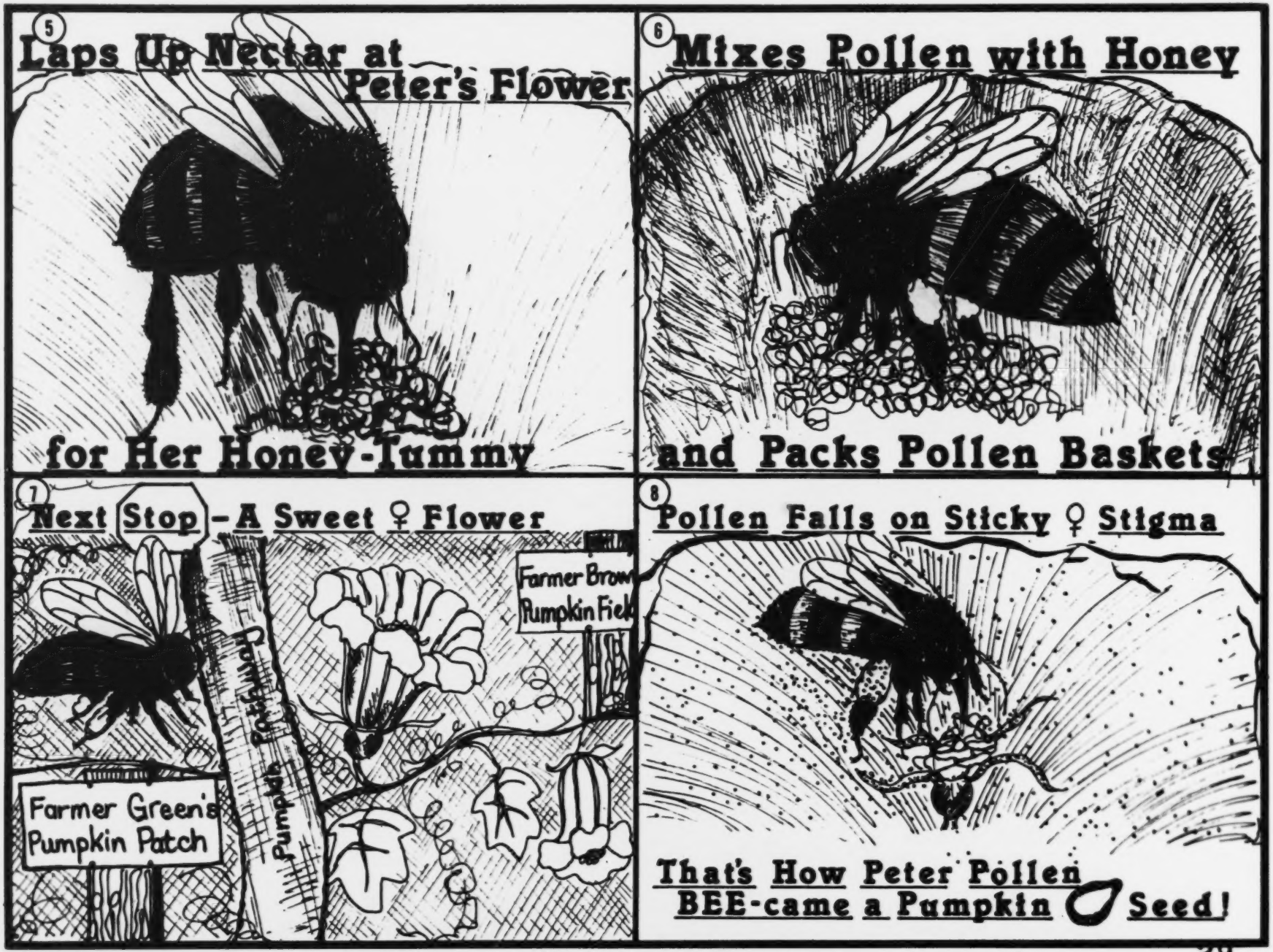
That's Harriet Honeybee leading the way.

Peter's pollen-filled flower's
the first stop of her day!

HIP! HIP! HOORAY!!

HIP! HIP! HOORAY!


1
Bees Leaving Hive
2
Favorite Flower Patch
Farmer Brown's Pumpkin Field
Pumpkin Pathway
Farmer Green's Pumpkin Patch
3
Harriet Stops at Peter's ♂ Flower
Farmer Green's Pumpkin Patch
4
Pollen Flies Everywhere
and
Peter Sticks to Harriet's Hair


5
Laps Up Nectar at Peter's Flower
for Her Honey-Tummy
6
Mixes Pollen with Honey
and Packs Pollen Baskets
7
Next Stop - A Sweet ♀ Flower
Farmer Green's Pumpkin Patch
Pumpkin Patch
Farmer Brow
Pumpkin Fiel
8
Pollen Falls on Sticky ♀ Stigma
That's How Peter Pollen BEE-came a Pumpkin Seed!

A **SEED** Story ~ continued

This flower has all
the (♂) male pollen she needs.

As Harriet works quickly, pollen flies everywhere
and Peter gets stuck on her soft body **hair**!

(It is there that the nectar
can be made into honey.)

Then **hair**-covered legs gather powdery pollen.
Her leg pollen baskets
are soon overflowing!

[Pollen + Honey = Bee food]

Honey mixed with the
pollen makes food for
young bees, and if Peter stays stuck (to Harriet's **hair**)
he may make a (seed)!

Harriet will need more nectar this day
so with pollen-filled baskets, she flies on her way.
Farmer Brown's (♀) female flowers, **sticky** and sweet,
invite hungry bees to a nectar-filled treat.

As she enters a flower,
pollen's brushed from her hair.

Some **sticks** to the stigma.
(That's how Peter got there.)

Peter Pollen can grow now, thanks to Harriet Bee,
and in this pumpkin flower
he BEE-comes .... Peter (seed)!

Pollen Party
Place mat
"Peter's New Home"
Farmer Brown's Pumpkin Field
Pumpkin Pathway
Harriet's First
Farmer Green's Pumpkin Patch

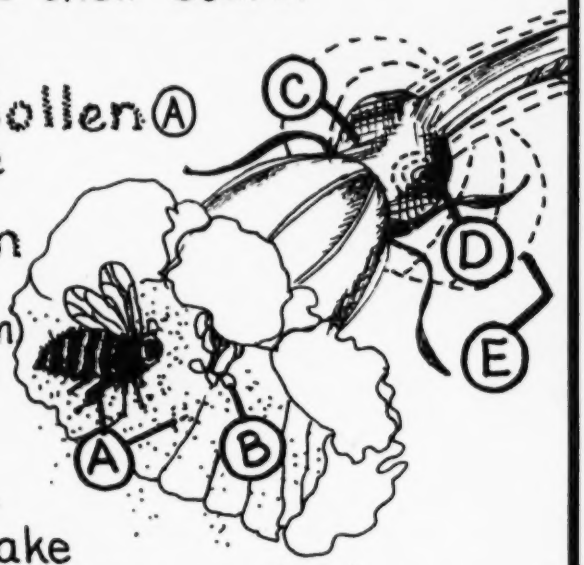
"Before we plant seeds, let's do ..."

A Seed Science Review

Pumpkins grow this **LARGE** to make food for their seeds. The size of a pumpkin actually depends on the ♀ flower visits of many pollen-covered bees, since pollen gives seeds their start.

BEE-coming a Seed

A hungry bee covered with pollen (A) stops to feed at a flower. The **sticky** stigma (B) of the ♀ flower catches the ♂ pollen dropped by the bee. This is called pollination. (POWL-lin-nay-shun) The ♂ pollen moves down a tube into the seed-holding part of the flower (C) to begin the life of a new seed (D). Flower part (C) becomes larger to make food for the young seeds inside it and that's how (C) grows to become the pumpkin (E) ~ the more seeds, the larger the pumpkin. In time, the seeds will be ripe and ready to grow new pumpkin plants.



Pollen Party Place Mat-Facing Page (Questions to be discussed and answered orally)

It's a fact that at least "15" pollen-covered bees need to visit one ♀ flower to grow a really **LARGE** pumpkin.

Can you find "15" honeybees?

How many pollen-making ♂ flowers do you see?

Fr. Green's ☐ + Fr. Brown's ☐ = ☐ ♂ flowers

How many pumpkins can grow in Farmer Brown's Field? ☐

(Peter's Helpful Hint ~ count the ♀ flowers)

Color the bees BROWN and YELLOW.

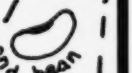
Color the ♂ flowers YELLOW.

Color the ♀ flowers ORANGE.

Color the leaves GREEN.

(♂ and ♀ flowers are actually a yellow/orange.)

The Green Thumb Guide

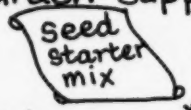


"Get growing with..."

Materials needed: ①Pumpkin, corn, bean, and acorn seeds (See "Guide" for suggestions on obtaining specific seed type.)

②Available at garden supply stores

and



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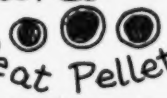
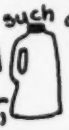


Substitute

Potting Soil and Vermiculite (mix equal parts)

③ Water*

Keep in covered plastic container,

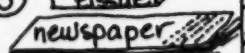


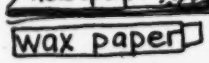
such as throw-away milk bottle

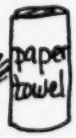
Use distilled or boiled and cooled water. Do not use water (with chlorine) directly from faucet.

④ Spray-misting bottle

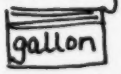
⑤





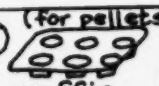


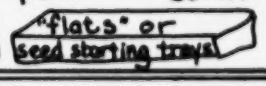
⑥ Plastic Bags



(Ziploc type)

⑦

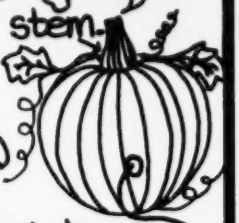




Green Thumb Guide to Pumpkin (Seed) Science

Flowers pollinated by insects (mainly bees)

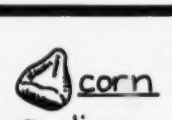
Obtain a ripe (orange) pumpkin. Take a close look at the stem. Use a pointed pencil and discover if the lines in the stem match those on the pumpkin. (The stem gets larger right along with the pumpkin after pollination.) Cut the pumpkin open to remove the seeds. (This is a job with "strings attached" for a fun-filled learning experience.) Children will discover each seed is holding on to string-like tissue that connects the seed to the inside wall of the pumpkin. You could call the string a "lifeline," for through it travels everything needed by a living, pollinated pumpkin seed.

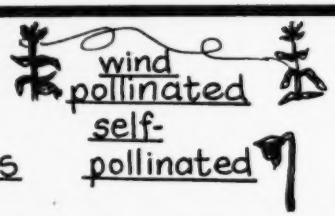


Remove the ready-to-grow seeds from the "lifelines," which are no longer needed. Rinse the seeds thoroughly through a colander. Tamp dry with a paper towel and then spread on waxed paper for further drying. Let dry for one week before starting the following planting activities. (If a ripe pumpkin is unobtainable, purchase a package of seeds at a garden store.)

Basic Steps to Seed Science

GREEN THUMB GUIDE to PUMPKIN SEEDS PLUS . . . .





To begin: When pumpkin seeds (p.26) have dried for one week, pick some "plump" seeds for planting. [Save remaining seeds for special snack, p.28.] Packaged corn and lima bean seeds may also be used with the planting activities described here.

(A) Seeds Have Roots! (A window to the underground world of plant roots)

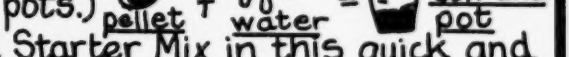
Soak several seeds in water* for one hour. Dampen a piece of white tissue or toweling. Place dampened tissue and seeds in a quart-size plastic bag.

Seeds should be visible and resting against the damp tissue. [ZIP BAG SHUT AT TOP.]

(B) Seeds Have Needs

(Preparing a "Growing Greenhouse")

Spread newspaper in planting area. If peat pellets are to be used, follow directions on package. (Children enjoy watching the pellets absorb water* and turn into planting pots.)



When using peat pots, moisten Seed Starter Mix in this quick and easy way. Place 4 cups dry mix and 1 cup water* in gallon-sized plastic bag. Zip bag shut and have child "knead" until well-mixed. If additional planting soil is required, repeat process, always maintaining a 4 to 1 ratio of dry mix to water. (For Potting Soil and Vermiculite, use 2 cups soil, 2 cups Vermiculite, 1 cup water*.) Now set bag of soil in a planting tray and have children fill the peat pots ¾ full. Remembering a baby plant is inside each seed, *gently* push one presoaked seed into the soil until half-covered. Plant Pumpkin → and Corn pointed-side down. Plant lima bean ← eye-side down. Spoon additional moistened soil over the seed. (Pumpkin and Lima Bean seeds should be covered with about 1 cm. of soil, corn seeds with 3cm. of soil.)

Recommended Option - Obtain 3" high, clear plastic disposable cups, approx. 8oz. capacity. *- Punch drainage holes in bottom, using pointed metal object. Place soil-filled peat pots or prepared pellets in the plastic cup for support. Then continue with the following directions for "bagging a greenhouse."*

Set seeds from (A) above and all bagged pots in a planting tray. Then place the tray inside a large (dark) plastic bag. Twist tie shut and set in very warm location ~ warm air registers, furnace or boiler rooms, sunny windows, (daytime only, move at night). Even, moist heat creates a veritable "hot house" for quick germination. *T/P Guide, inside back cover

--Planting Alternatives--

More Basic Steps to... Seed Science

Green Thumb Guide (continued)

WHO GROWS THERE? (Sprouting Seeds and Popsicle Sticks)

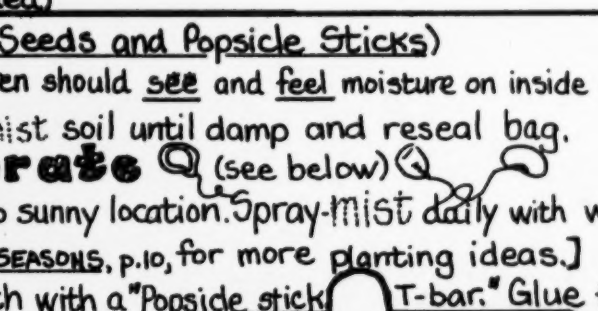
Check plastic "greenhouse" daily. Children should *see* and *feel* moisture on inside of individual planting bags. If dry, spray-mist soil until damp and reseal bag.

WHEN SEEDS SPROUT... (1.) **Celebrate** (see below)

(2) Remove all plastic and move pots to sunny location. Spray-mist daily with water.

**[See Book 5, YOUNG SCIENTISTS EXPLORE SEASONS, p.10, for more planting ideas.]

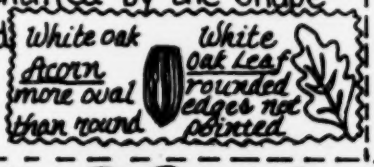
(3) Keep track of the baby plant's growth with a "Popsicle stick T-bar." Glue three Popsicle sticks—one horizontal, two vertical as illustrated. The horizontal stick can be labeled, as shown, with permanent marker. The vertical stick can be used to show plant height. The "Centimeter Slide Rule" (see** above) provides another creative way to record plant measurements. [Further records can be kept of the interesting growth of a bean plant by using pages 29 and 30 of this book.] All three of these seeds grow rapidly and may be transferred to large planting containers (peat pot and all), once they have grown past their "T-bar." Continued growth will depend on space and the environment provided.



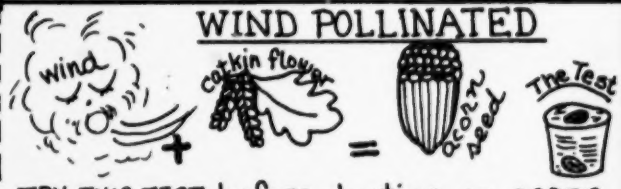
FOR A MORE LONG-TERM PROJECT try...

The Green Thumb Guide to Growing an Oak Tree

Acorns of the White Oak Family can be found "ready to grow" in the fall. They can easily be identified by the shape of the acorn and the distinctive white oak leaf.



WIND POLLINATED



TRY THIS TEST before planting an acorn. Pour water in small plastic cup. Have children drop "undamaged" white oak acorns, without caps, one at a time into the water. If an acorn sinks to bottom, it is probably capable of growing. *(Floating acorns will not sprout.)*

TO PLANT ACORNS follow (A) (B) and (C). After seedling is 15 cm. tall, keep in cool, naturally lit area. Water lightly. You can PLANT A TREE in spring.

Get your place mat ready (p.24) It's party time!

Clear Con-Tact the place mat to tagboard and use it for several celebrations.

Garden Party Celebrate "Flowers and Bees" with fruits and vegetables (p.19) and a festive dip.

Popcorn Party Crunch Purchase dried sweet corn kernels and prepare with regular popping corn. Eat and enjoy a nutty "parched" and "popped" corn treat!

CELEBRATE SEEDS

PETER'S PUMPKIN SEED SNACK

Microwave Recipe: Melt 1 tbsp. butter or margarine in 9" microsafe pie plate. Stir in dried pumpkin seeds and microwave on HIGH, 7 minutes. Stir seeds and turn dish ¼ every 2 min. Let stand 5 min. & enjoy warm, after salting. OR Bake at 300° on greased cookie sheet 5-10 min. Turn occasionally til' toasted. Salt & serve warm.

Baby Bean Plant Parts

(A.) Bean Seed ?

(B.) First (Primary) Root white

(C.) Seed Coat

(D.) Second Roots

(E.) Plant Stem green

(F.) Food Leaves ?

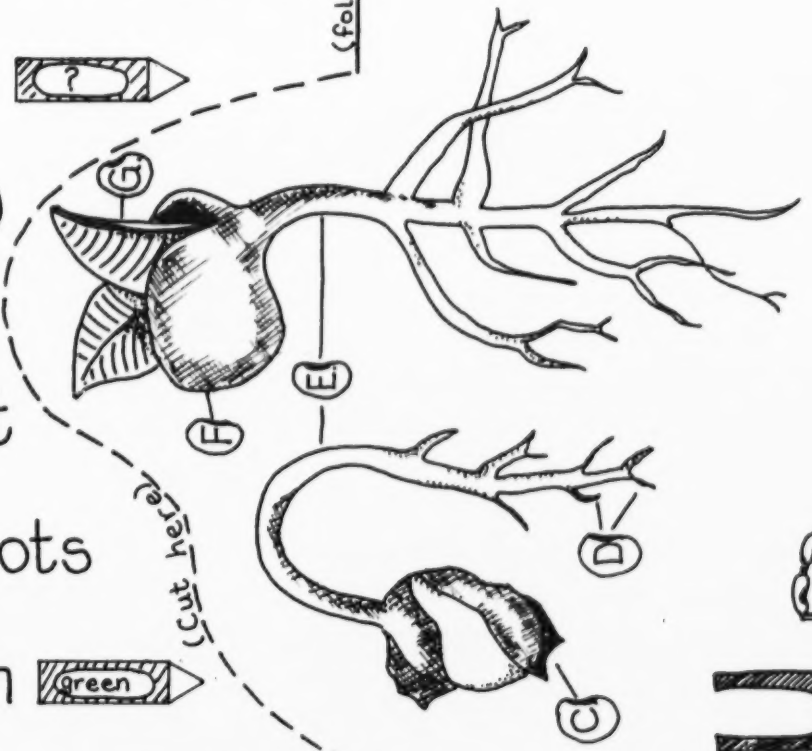
(G.) First True Leaves

(Color True Leaves green)

(fold here)

(cut here)

(fold here)



Baby Bean Book

My Bean Seed

was planted on _____

The Stem was seen on _____

The Seed Coat was shed on _____

The True Leaves were seen on _____

Bean Plant drawn by _____

Baby Bean is ___ days old and ___ centimeters.

CUT ON BROKEN LINE

Roots B+D

Seed Coat C

Stem E

Food Leaves F

First True Leaves G

Connect-a-Part →

"Baby Bean's First Picture"

TEACHER/PARENT GUIDE to Extending Activities

A CATKIN CELEBRATION (p.9)

In addition to the Oak Family, other types of trees have pollen-producing catkin flowers. Look for these male flowers in the spring and add two more verses to the "Catkin Song."

2nd Verse: Spin, spin, spin. Spin, little catkin, spin.
Pollen in the breeze means there'll be seeds
If you spin, little catkin, spin.

3rd Verse: Whirl and twirl. Whirl, little catkin, whirl.
Pollen in the breeze means there'll be seeds
If you twirl, little catkin, twirl.

Celebrate tree-seed beginnings with Catkin Finger Costumes!

Punch a center hole in small yellow paper squares and some styrofoam packing pieces. String alternately on a piece of yarn. Tie a loop at the end of the yarn so the catkin costume can be worn on a child's finger while moving to the music of "A Catkin Celebration."

POLLEN PUZZLERS (p.14)

Answer Key: seeds, bees, pollen, female, seeds

POLLEN "PICKER-UPPERS" (pp.16-18)

Quick and easy substitutes for the "pollen experiment" can be obtained by using a paintbrush for Harriet Honeybee. A child could use a smooth finger in place of the Baldie Honeybee puppet.

A SEED STORY (pp.20-23)

The story pictures may be colored, covered with clear Con-Tact paper, and mounted on poster board. Use the pictures individually to follow the story as it is read. The picture cards can also become a learning center activity. Children will enjoy using the cards to sequence the adventures of Peter Pollen on his way to "bee-coming a seed."

Order of Events: (1) Fifteen honeybees, led by Harriet, leave the hive to (2) visit a pumpkin flower patch. (3) Harriet Honeybee stops at the male flower with Peter Pollen inside. (4) As Harriet goes into the flower, pollen flies everywhere. Peter gets stuck in her soft body hair. (5) Harriet laps up nectar from the male flower and then (6) packs pollen into her leg baskets until they are full. (7) With Peter safely stuck in her hair and two pollen-packed leg baskets, Harriet leaves the male flower to search for more nectar across Pumpkin Pathway. (8) Harriet finds a nectar-sweet flower in Farmer Brown's Field. While she fills her honey-tummy with nectar, Peter Pollen falls out of Harriet's hair onto the female flower's sticky stigma. With the help of "hairy" Harriet Honeybee, Peter will now become a pumpkin seed inside the female flower.

BASIC STEPS TO SEED SCIENCE (p.27-28)

Important consideration when planting corn, bean and pumpkin seeds (also acorns): Each planted seed must be bagged individually in plastic before setting inside the large plastic bag with other seed containers.

Once the young plants have formed green leaves, encourage children to notice the plant's movement toward light by changing the position of the planting container. Point out the interesting fact that the green leaves use sunlight to make food for the plant. Although plants can not "walk" into the sunlight, they can turn their food-making leaves in the direction of the strongest light available.

To grow a class citrus tree (lemon, grapefruit, etc.), simply wash seeds after removing from the fresh fruit. Plant as directed for pumpkin, corn and bean seeds.

BABY BEAN BOOK (pp.29-30)

Fast-growing lima bean seeds deserve their own baby book. This four-page version with pop-up cover provides a way to color code each new plant part as it is observed; record the dates of important events like planting and sprouting as well as picture the plant's actual size and special parts in a drawing space.

Important memories are made and interest encouraged when a record-keeping activity, such as this, accompanies a child's planting discoveries. Record keeping can become a lifelong learning tool to better understand science and the living wonders of our natural world.

SUGGESTED READING

The Reason for a Flower by Ruth Heller, Grosset & Dunlap, New York

What Is a Fruit? by Jenifer W. Day, The Golden Press, New York

A Tree Is a Plant by Clyde Bulla, Thomas Y. Crowell Co., New York

Oak & Company by Richard Mabey, Greenwillow Books, New York

Honeybees by Jane Lecht, (Books for Young Explorers), National Geographic Society

Honeybees by Graham Tarrant, (Natural Pop-Ups), G. P. Putnam's Sons, Los Angeles, CA

The Honeybee & the Robber by Eric Carle, Philomel Books, New York

Young Scientists Explore The World of Nature by Linda Penn, Good Apple, Carthage, IL

Young Scientists Explore Seasons by Linda Penn, Good Apple, Carthage, IL

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